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ABSTRACT

Elementary science educational library resources in New England graduate and undergraduate teacher education institutions were compared using a 31-item survey instrument developed for library directors. Data were obtained from 62 institutions with certified elementary education programs (72 percent response rate). Among the findings reported are: (1) inadequate resources except for fiction science trade books at undergraduate institutions and science reference books at both undergraduate and graduate institutions; (2) a severe lack of computer software at both institutions; and (3) "Science News" was the only science education journal available in more than 60 percent of the undergraduate institutions. In addition, more than 75 percent of the surveyed graduate institutions had "Education Index," "CIJE," "RIE," and "Dissertation Abstracts," while only "Education Index" was available in more than 75 percent of the undergraduate institutions. Since there are not additional publications on science education library resources, it is difficult to determine whether New England institutions are typical or atypical. However, findings illustrate the need to improve the science education resources, journals, and support resources at New England teacher education libraries. (JN)

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**ELEMENTARY SCIENCE EDUCATION LIBRARY RESOURCES
IN GRADUATE AND UNDERGRADUATE TEACHER
EDUCATION PROGRAMS OF NEW ENGLAND**

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Introduction

The recent National Science Board report (1983) addressed the need for quality science education to begin at the elementary level. This is essential because by the end of third grade, students' attitude toward science are established (Hurd, 1983). Walton (1983) in the Education Week special report on mathematics and science education summarized the poor status of science education in the K-6 classroom. In support of this, Mechling (1982) found that more than 50 percent of largest teacher education programs in the United States needed more emphasis on science content, science processes and methods, and science teaching techniques.

The AAAS Commission on Science Education, (Herron 1970) recommended that preservice elementary science teachers should develop "...habits of continually seeking new information" (p. 20). One of the campus resources that provides preservice teachers opportunities to develop this charge is the quality of the library. Yager in his study of graduate science education programs (1982) did not ascertain information about library resources. An ERIC computer search found no published reports on library resources as they relate to science education.

Procedures

The purpose of this study was to compare elementary science education library resources in graduate and undergraduate teacher education institutions in New England. A thirty-one item survey was developed for librarian directors of New England. The instrument was reviewed by two science educators and two library educators. The survey instrument with cover letter and self-addressed stamped envelope were sent during April, 1983. Two-weeks later all non-respondents received a follow-up letter, survey, and self-addressed stamped envelope. Berty's (1979) guidelines were followed in processing the survey. There was a 72% return rate from the 87 teachers education institutions of New England with certified elementary education programs.

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Prepared programs from the Statistical Package for the Social Sciences (SPSSX, 1983) were utilized for data analysis. Of the 62 responding institutions, 42 (68%) had graduate education programs. Only 3 of the 42 graduate programs had no elementary science methods course while 5 of the 20 undergraduate institutions failed to offer an elementary science methods course to their students.

Results

Differences were found between graduate and undergraduate institutions. More than 75% of the surveyed graduate institutions had Education Index, CIE, ERIC, and Dissertation Abstracts, while only Education Index was available in more than 75% of the undergraduate institutions (Table 1). School Science and Mathematics, Science and Children, Science Education, Science News, and The Science Teacher were the only science education journals available in more than 75% of the graduate institutions. Science News was the only science education journal available in more than 60% of the undergraduate institutions (Table 2). Arithmetic Teacher, Instructor, Language Arts, The Reading Teacher, and Teacher were available in more than 2/3 of the graduate and undergraduate institutions (Table 3).

The results of this study found library resources available for pre-service elementary science education were inadequate except for fiction science trade books at undergraduate institutions and science reference books at both undergraduate and graduate institutions. Both graduate and undergraduate institutions gave a higher rating for their K-6 science textbooks published prior to 1980 than those published after 1980. Both graduate and undergraduate institutions were severely lacking in science computer software (Table 4).

For the library resources comparison, the adequate and more than adequate categories were grouped together and the inadequate and not available formed

the other group. Differences between resources, journals and support resources in graduate and undergraduate libraries are found in Table 5. Significant differences were found for ERIC, ERIC microfiche availability, Dissertation Abstracts, and computer search capabilities for resources. Young Children was the only non-science journal where there was a significant difference while for the Journal of Research in Science Teaching, Science Education, and The Science Teacher there was significant differences between graduate and undergraduate institutions. There was no significant difference for support resources.

Insert Tables 1-5 about here

Conclusion

Since there are not additional published articles on science education library resources, it is difficult to determine whether New England institutions are typical or atypical. A broader concern than libraries is that eight of the 62 institutions fail to offer an elementary science method course. Graduates of about 13% of these institutions will become elementary teachers without being prepared to teach science. These graduates will probably continue the poor science teaching patterns regarding science (i.e. textbook bound, teach without manipulates, do not teach science, etc).

Additional studies need to be conducted to determine the quality of graduate studies where institutions lack ERIC microfiche, Dissertation Abstracts, and computer search capabilities. How can graduate students and faculty conduct research without these resources? Are these graduates being prepared to utilize research results? The Journal of Research in Science Teaching is the most important journal for science education researchers and

is absent in almost 40% of the reporting libraries. In addition, Science Education and School Science and Mathematics are unavailable in more than 20% of the graduate libraries, and almost half of the undergraduate institutions fail to have Science and Children available for their elementary education majors. Overall, the available journals to facilitate elementary education students are lacking for both graduate and undergraduate in science education. How are preservice students to develop the habit of seeking new information when appropriate journals are unavailable?

It is unfortunate that preservice students visit their campus library to examine available science textbooks and find that there are a greater quantity of K-6 science textbooks published prior to 1980. These students might not be prepared to deal with the more modern editions. Preservice student's might judge the quality of science resources based upon a text that is no longer available. Consequently preservice students would be getting a distorted view of science education.

Librarians were aware of the needs to improve science education at their institution. In response to an open-ended question about their top five priorities, they identified computer software and audiovisuals as the top two priorities. The availability of these resources would facilitate the preparation of elementary science teachers.

Insert Table 6 about here

The results of this study illustrate the need to improve the science education resources, journals, and support resources at New England teacher education libraries. By improving the library's quality in science education, teacher education institutions will be helping to address the crisis in science education.

BIBLIOGRAPHY

- Berty, E. (1979) Ye olde maile survey. Charleston, W.V., (ERIC Document Reproduction Service NO. ED. 177 710).
- Hurd, P.D. (1983) What is the problem? In Science and Mathematics in the Schools: Report of a convocation. Washington, D.C.: National Academy Press.
- Herron, J.D. (1970) Preservice science education of elementary school teachers. Washington, D.C.: AAAS Commission on Science Education.
- Mechling, K. (1982) Survey results preservice preparation of teachers of science at the elementary, middle, and junior high school levels. Washington, D.C.: National Science Teachers Association.
- National Science Board. (1983) Educating Americans for the 21st Century. Washington, D.C.: National Science Foundation.
- Walton, S. To democratize science curriculum for "citizens". Education Week Mathematics and Science Education supplement, July 27, 1983.
- Yager, R.E. (1983) A review of science education in graduate centers in the United States. Journal of Teacher Education, 33(1): 22-4.

Table 1

Educational Resources Available for the Graduate, Non-graduate, and
Composite Frequencies for New England Teacher Education Institutions

	Graduate		No Graduate Program		Composite		No Response	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
<u>Education Index</u>	40	97.6	20	95.2	60	96.8	1	1.6
<u>CIJE</u>	34	82.9	14	66.7	48	77.4	0	0
<u>ERIC</u>	37	90.2	13	61.9	50	80.6	0	0
<u>ERIC microfiche available</u>	28	68.3	7	33.3	35	56.5	1	1.6
<u>Dissertation Abstracts</u>	31	75.6	6	28.5	37	59.7	1	1.6
<u>Computer Search Capabilities</u>	26	63.4	7	33.3	33	54.1	1	1.6

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Table 2

Science Education Journals Available at New England Graduate, Non-graduate
and Composite Teacher Education Institutions

	Graduate		No Graduate Program		Composite		No Response	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
<u>Journal of Research in</u>								
<u>Science Teaching</u>	25	61.0	3	14.3	28	45.2	0	0
<u>School Science and Mathematics</u>	32	78.0	118	52.4	43	69.4	0	0
<u>Science Activities</u>	76	17.1	2	9.5	98	14.5	0	0
<u>Science and Children</u>	32	78.0	110	52.4	43	69.4	0	0
<u>Science Digest</u>	28	68.3	12	57.1	40	64.5	0	0
<u>Science Education</u>	31	75.6	6	28.6	37	59.7	0	0
<u>Science News</u>	36	87.6	19	90.5	55	88.7	0	0
<u>The Science Teacher</u>	34	82.9	10	47.6	44	71.0	0	0

Table 3

Non-Science Education Journals Available at New England Graduate, Non-graduate
and Composite Teacher Education Institutions

	Graduate		No Graduate Program		Composite		No Response	
	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>	<u>n</u>	<u>%</u>
<u>Arithmetic Teacher</u>	35	85.4	14	66.7	49	79.0	0	0
<u>Early Years</u>	16	39.0	7	33.3	23	37.1	0	0
<u>Health Education</u>	19	46.3	8	38.1	27	43.5	0	0
<u>Instructor</u>	38	92.7	16	76.2	54	87.1	0	0
<u>Language Arts</u>	39	95.1	15	71.4	54	87.1	0	0
<u>The Reading Teacher</u>	37	90.2	17	81.0	54	87.1	0	0
<u>Teacher</u>	35	85.4	14	66.7	49	79.0	0	0
<u>Young Children</u>	32	78.0	100	47.6	42	67.7	1	1.6

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Table 4

Librarian's Perceived Quantities of Resources Available at New EnglandGraduate, Non-graduate, and Total Teacher Education Institutions

	Graduate		No Graduate Program		Total	
	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>	<u>X</u>	<u>S.D.</u>
	<u>n = 41</u>		<u>n = 21</u>		<u>n = 62</u>	
Elementary Science Textbooks						
Prior to 1980	2.105	1.034	2.300	1.081	2.172	1.045
1980 +	2.564	0.852	2.579	1.261	2.569	0.993
Non fiction Science Trade						
Books	2.150	0.949	2.105	1.197	2.136	1.025
Fiction Science Trade Books	2.350	1.051	1.995	1.329	2.203	1.156
Resource Files on Current						
Science Topics	2.675	0.944	2.300	1.081	2.550	0.999
Science Reference Books	1.846	0.709	1.947	0.970	1.879	0.796
Audio-visuals Materials						
for Science	2.775	0.862	2.474	0.954	2.678	0.899
Computer Software for						
Science	3.395	0.887	3.444	1.149	3.411	0.953

Table 5

Resources, Journals, and Support Resources
Differences in Graduate and Undergraduate Programs

	χ^2	P
Resources		
<u>Education Index</u>	0.10923	0.7410
<u>CIJE</u>	1.27313	0.2592
<u>ERIC</u>	5.44498	0.0196
<u>ERIC microfiche available</u>	8.15034	0.0170
<u>Dissertation Abstracts</u>	11.83987	0.0006
<u>Computer search capabilities</u>	4.35878	0.0368
Journals		
Non-science		
<u>Arithmetic Teacher</u>	1.91045	0.1669
<u>Early Years</u>	0.02601	0.8719
<u>Health Education</u>	0.12192	0.7270
<u>Instructor</u>	2.05377	0.1518
<u>Language Arts</u>	4.08881	0.0255
<u>Reading Teacher</u>	0.84958	0.3567
<u>Teacher</u>	1.91045	0.1669
<u>Young Children</u>	7.30615	0.0259
Science		
<u>Journal of Research in</u>		
<u>Science Teaching</u>	10.41117	0.0013
<u>School Science and</u>		
<u>Mathematics</u>	3.18181	0.0745
<u>Science Activities</u>	0.17451	0.6761
<u>Science and Children</u>	3.18181	0.0745
<u>Science Digest</u>	0.34573	0.5565
<u>Science Education</u>	10.88905	0.0010
<u>Science News</u>	0.0	1.0000
<u>The Science Teacher</u>	6.77624	0.0092
Support Resources		
Textbooks		
Prior to 1980	0.0	1.000
1980 +	0.59865	0.4391
Nonfiction science trade		
books	0.66765	0.4139
Fiction science trade books	0.01188	0.9132
Resource files on current		
science topics	0.00834	0.9272
Science reference books	0.18175	0.6699
Audio-visual materials		
for science	0.38878	0.5329
Computer software for		
science	0.01115	0.9129

Table 6

Composite Ratings of Top Five Concerns for Libraries

<u>Concern</u>	<u>Frequency</u>
Computer Software	24
Audiovisual	21
Current edition K-6 science textbook	16
Kits, manipulatives, etc.	15
Computer hardware	11
Additional science education periodicals	8
Additional science education references	6
Computer search capabilities	6
Additional science resource books	5
Faculty who utilize library resources	4
Additional science teacher resource guides	3
Area school science curriculum guides	3
ERIC system	3
Additional trade books	3
Energy resources	1
More effective sharing with cooperating institutions	1

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